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ARIZONA STATE UNIVERSITY ■ COLLEGE OF BUSINESS
CENTER FOR BUSINESS RESEARCH

Arizona Industrial Structure

Services and Trade Rank One and Two

Misinformation concerning the Arizona economy – particularly its industrial structure – still is widespread. Such inaccuracies are unnecessary, since a variety of data is available, and unfortunate because they may adversely affect both the government's allocation of resources and the decisions of those considering relocation to Arizona.

For example, tourism frequently is reported to be Arizona's second largest industry, and agriculture sometimes is called third largest. Neither statement is accurate. The purpose of this study is to clear up confusion and misrepresentation regarding the Arizona industrial structure.

While an accurate representation of the structure is presented in this article, a definitive ranking cannot be agreed upon. Industries may be defined in a variety of ways and quantified by several measures. Other difficult-to-quantify concerns must also be considered.

ARIZONA'S MAJOR INDUSTRIES

The Standard Industrial Classification (SIC), developed by the federal government, is by far the most widely used system of categorizing industries. Hierarchical in nature, the SIC combines narrowly defined industries into progressively broader groups. Nine major industries finally result: agriculture; mining; construction; manufacturing; transportation, communications and public utilities (TCPU); trade; finance, insurance and real estate (FIRE); services; and government.

See "AZ Industries," page 2

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Statewide Report

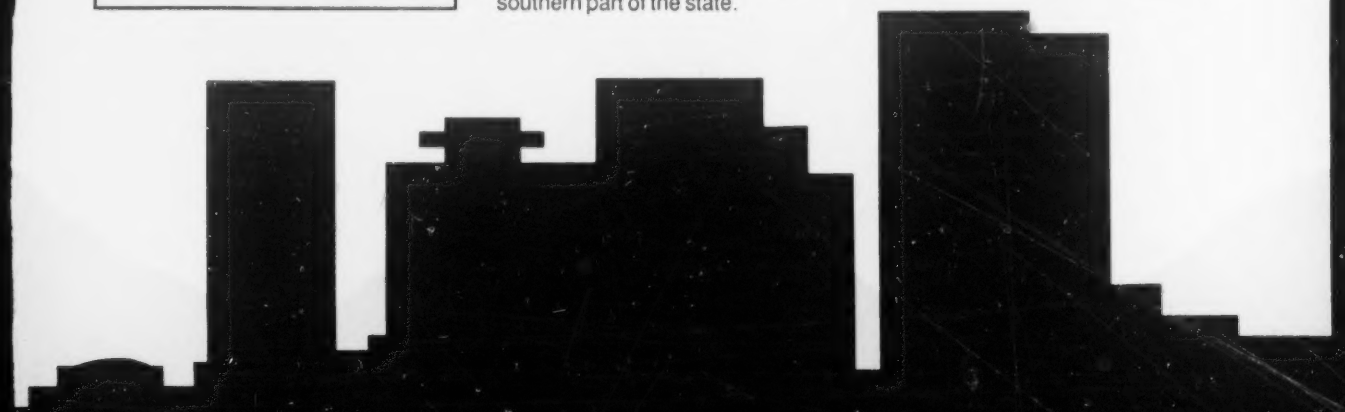
Small-Town Living Not Always Cheaper

Across the United States, living costs are generally lower in small communities than in large cities or metropolitan areas. However, cost-of-living information compiled for four non-metropolitan communities in Arizona reveal that this national pattern does not hold in all cases. The cost of living was found to be higher in two northern Arizona towns than in Phoenix or Tucson but lower in two communities in the southern part of the state.

BACKGROUND

Measures of the cost of living in Arizona communities are of potential interest to many people both in and outside the state. This information is particularly useful to individuals considering a move from one city to another and to businesspeople planning to relocate or expand to another area.

See "Cost of Living," page 5



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"AZ Industries," from page 1

Employment, PI, GSP

Several economic indicators can be used to measure the size and activity of an industry. For Arizona, at the level of the nine major industries, three measures are readily available and provide internally consistent estimates among industries. However, these measures – employment, personal income (PI) and gross state product (GSP) – may not agree on an industry's relative size.

Each major industry's share of these three measures is shown in Figure I. Clearly, the four largest industries are services, trade, manufacturing and government. Each is appreciably larger than the construction and TCPU sectors, which in turn contribute noticeably more employment, income and GSP than the agriculture and mining industries. Table 1 presents a ranking based on the consensus of the three measures.

Some of the deviations among these measures are easily explained. Services and trade are labor-intensive industries. Their employment numbers, as well as those of agriculture, include many seasonal and part-time workers. Salaries are relatively low. Thus, each industry is larger when quantified by employment than by either of the dollar measures. In contrast, manufacturing, mining, and TCPU are high-paying industries, not highly labor-intensive. Their shares of employment, therefore, are smaller than their shares of PI and GSP.

Only the sectoral shares of finance, insurance and real estate vary appreciably by economic measure. The value added by real estate, through rental income and taxes paid, is primarily responsible for the relatively large share of GSP.

Other Measures

Other gauges of size, particularly those related to sales or value, commonly are used to rank industries. Such comparisons are inappropriate, however: The unit of measurement is not consistent among industries, and the same indicators are not available for all industries. It is misleading and inaccurate to base comparisons on such incomparable measures.

A blatant case of "comparing apples and oranges" results from likening manufacturing *output* to tourism *expenditures* to *value* of agricultural or mining production. Omitting all other industries from the comparison makes the resulting conclusions even more erroneous. This specific example is responsible for much of the misinformation cited earlier.

ANOTHER DEFINITION OF INDUSTRIES

A major shortcoming of the SIC is that tourism is not defined as an industry. Tourism encompasses a portion of several SIC industries, particularly trade, services and transportation. Because most businesses, such as restaurants or gas stations, serve both tourists and residents, tourism cannot be measured by conventional means.

Tourism

Most tourism data derives from three studies conducted at ASU for the Arizona Office of Tourism. The first two studies, in fiscal years 1975-76 and 1979-80, were conducted by the Center for Business Research. The last study, in 1984, was prepared by the College of Public Programs, using the same methodology.

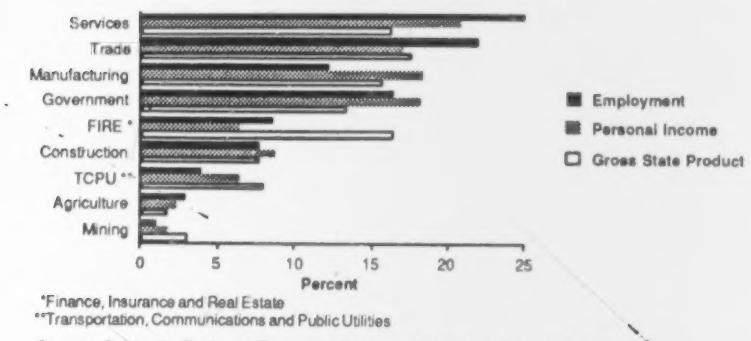
The primary outputs of these studies – estimates of the total number of tourists and of total tourist expenditures – cannot be compared to other indicators in other industries. However, the tourism studies did include an estimate of employment in the tourism industry (80,010 in 1984). While it is likely that the impact of tourism estimated in these studies, including employment, is overestimated[1], the lack of more accurate data forced the use of the 80,000-jobs figure in comparing tourism employment to that in other industries.

Industry Rankings

The result of this comparison is shown in Table 2. In addition to removing the 80,000 tourism workers from the appropriate industries, several of the major industries were subdivided to produce a relatively small number of industries with definitions more specific to the Arizona economy. For instance, high-technology manufacturing and real estate are shown as separate indus-

[1] An overstatement could have resulted from both an overestimate of the number of tourists as well as overvaluation by the tourists of their expenditures. More information is included in the complete report on this study (see gray box on page 5).

FIGURE I
ARIZONA SECTORAL SHARES, 1984



*Finance, Insurance and Real Estate
**Transportation, Communications and Public Utilities

Source: Center for Business Research, College of Business, Arizona State University; and U.S. Department of Commerce, Bureau of Economic Analysis.

TABLE 1
AVERAGE RANK ORDER OF ARIZONA'S NINE MAJOR INDUSTRIES
Based on Employment, Personal Income, Gross State Product

1. Services
2. Trade
3. Manufacturing
4. Government
5. Finance, Insurance and Real Estate
6. Construction
7. Transportation, Communications and Public Utilities
8. Agriculture
9. Mining

Source: Center for Business Research, College of Business, Arizona State University

tries. The definition of industries in Table 2 admittedly is somewhat arbitrary. Other reasonable definitions could be constructed, illustrating the difficulty of using any scheme other than the SIC to rank industries.

Even after removing the tourism component and subdividing the remaining services and trade employment each into three subindustries, their components still rank as the largest industries. Agriculture and mining, even with no subdivision, are found near the bottom of the list. Tourism falls in the middle.

MAJOR INDUSTRIES, BY COUNTY

Wide differences exist in the industrial structures of Arizona's 15 counties. In terms of the total state economy, these variations are relatively insignificant since the two metropolitan counties account for such a large share of the state's economic activity (84 percent of employment, for example).

The state as a whole may barely feel the effects of problems in rural industries such as mining or agriculture. To illustrate, the Arizona economy has grown strongly since 1982 even though both industries have remained mired in slumps. Several counties, however, are highly dependent on these industries. Mining is the primary employer in Greenlee County and provides significant numbers of jobs in Gila and Pinal counties. Agriculture is important to Yuma and La Paz counties.

Manufacturing is prominent in Maricopa County but hardly is found in Apache, Graham, Greenlee and La Paz counties. Trade is a significant part of the economy of most counties, particularly in Santa Cruz because of the international border and traffic through Nogales. Services, too, has a large presence in most counties, but is nearly nonexistent in Greenlee County.

Coefficient of Specialization

Compared to the Arizona industrial structure, the economies of many counties show considerable dependence on one or two industries. This dependence can be gauged by the coefficient of specialization, which adds up the differences between county sectoral shares and Arizona sectoral shares. The higher the value, which can range from zero to 100, the higher the specialization.

Greenlee County, almost entirely dependent on mining, has the highest coefficient (74). The five next most specialized counties range from Cochise (41) through Apache and Pinal to Yuma and Graham (31). Each of these counties is dependent on government. Most are dependent on agriculture or mining, as well, but have little manufacturing.

Most highly diversified, with coefficients of 7, are the two metropolitan counties. The economies of Mohave (9) and Yavapai (13) also encompass a mixture of industries.

Coefficient of Concentration

The geographic dispersion of industries across Arizona, compared to the state's population distribution, can be measured by the coefficient of concentration. Values again range from zero (spread evenly through the state with the population) to 100 (total concentration in one area).

Mining is the most concentrated industry, with a coefficient of 62. Found primarily in Greenlee and Pinal counties, little mining is done in Maricopa County, where 56 percent of the population reside. Agriculture, concentrated in Yuma County, with relatively little activity in Pima County; and FIRE, concentrated in Maricopa County, with relatively little activity in Pima County given its population, each have coefficients of 28. Except for government, with a coefficient of 9, the other industries all have a modest concentration in Maricopa County. Thus, even after adjusting for population, Maricopa County is Arizona's economic center for all industries except government, mining and agriculture.

ECONOMIC BASE ANALYSIS

In addition to direct measures of an industry's size, such as employment or GSP, other factors should be considered. Economic base theory assumes that certain industries are "basic" in that their growth leads and determines the region's overall development. Basic industries bring in money from outside the region by producing goods and services for export. In contrast, nonbasic activities result from the

TABLE 2
RANK ORDER OF ARIZONA'S INDUSTRIES
By 1984 Employment

	Employment	*Share*
1. Miscellaneous Services*	148,000	10.2%
2. Miscellaneous Retail Trade**	131,500	9.1
3. Construction	111,500	7.7
4. Business and Repair Services	107,500	7.4
5. Government (excluding military and schools)	104,800	7.2
6. Manufacturing (excluding high technology)	103,800	7.2
7. Schools	95,600	6.6
8. Retail Trade - Food Stores and Eating Places	87,400	6.0
9. Tourism	80,000	5.5
10. Health Services	75,800	5.2
11. Manufacturing - High Technology	72,600	5.0
12. Banking, Finance, Insurance	63,600	4.4
13. Wholesale Trade	61,400	4.2
14. Real Estate	60,500	4.2
15. Transportation, Communications, Public Utilities	48,800	3.4
16. Farm and Agricultural Services	43,100	3.0
17. Military	37,500	2.6
18. Mining	15,600	1.1
TOTAL	1,449,000	100.0

*Includes personal services, private households, amusement and recreation services, and professional and social services other than health.

**Includes building materials, general merchandise stores, apparel stores, home furnishings stores, and automotive dealers and service stations.

Source: Center for Business Research, College of Business, Arizona State University; from data of the U.S. Department of Commerce, Bureau of Economic Analysis.

region's overall growth, serving only the local population.

Location Quotients

The simplest means of identifying basic activities is by using a location quotient: the ratio of an industry's share of the regional economy to that industry's share of the national economy. If the ratio is greater than one, a portion of the industry's output is assumed to be basic (exported out of the region). While location quotients are crude measures, alternatives are prohibitively costly.

Arizona location quotients for major industries, based on several economic measures, are shown in Figure II. Although the different measures do not provide identical location quotients, they do coincide on the industries that provide basic activities.

Nature of Basic Activities

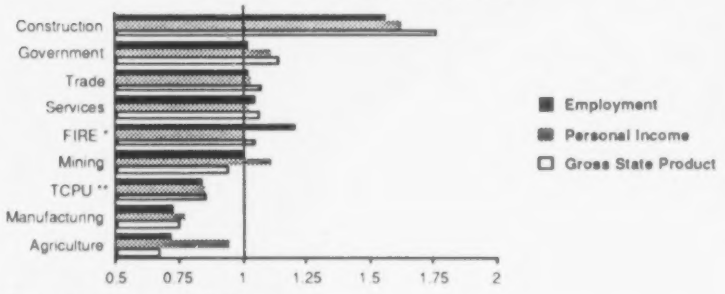
The location quotients of Arizona's major industries should be carefully interpreted. For example, while metal mining is almost entirely a basic industry, other types of mining, such as oil and gas extraction, are nearly non-existent. The entire mining industry, therefore, has little, if any, *net* exports.

According to location quotients, construction is Arizona's most basic industry. Construction is "exported" ... that houses and other buildings are frequently sold to parties living outside the state or to new residents. Thus, the construction industry is a measure of simple growth. It leads and determines Arizona's overall development because heavy in-migration fuels the economy.

Government is Arizona's second most basic industry, primarily because several large military bases are located in the state. Other large federal programs, such as those pertaining to the national forests and Indian reservations, also contribute as basic activities.

Services, trade and FIRE also have small basic components. Most of the "exports" of services relate to tourism. Some of trade's exports are also sold to tourists; others are purchased by the state's new residents, who frequently need items such as autos and home furnishings. FIRE's exports largely result from real estate activity, again due to rapid in-migration.

FIGURE II
ARIZONA LOCATION QUOTIENTS



*Finance, Insurance and Real Estate
**Transportation, Communications and Public Utilities

Source: Center for Business Research, College of Business, Arizona State University, and U.S. Department of Commerce, Bureau of Economic Analysis

The manufacturing industry is not a net exporter. In particular, the location quotient for nondurable goods is very low, with no component industry a net exporter. The durable goods portion of the industry, however, has a location quotient near one. Several of its subsidiary industries, particularly those involved with high-technology products, have basic components.

MULTIPLIERS

Once introduced, primary or initial spending tends to "multiply" through a local economy before finally escaping. For example, spending by a tourist from New York introduces new money into Arizona. The merchant receiving this money may, in turn, spend it on goods manufactured in the state. Eventually, however, the money escapes Arizona when the purchased goods or services are from outside the state.

Should tourism expand rapidly, merchants may need to add employees and purchase more goods manufactured in Arizona. In turn, the Arizona manufacturer may need to add employees and purchase more raw materials. Thus, the additional tourist expenditures ripple through much of the economy.

The degree of multiplication varies by geographic area and by nature of the original spending. The multiplier also varies by economic measure: Additional output by one industry may create more total output by all industries but fewer new jobs than the same amount of additional output by another industry. No single multiplier exists for a geographic area.

Arizona Multipliers

The U.S. Department of Commerce has produced multipliers for 38 industries in Arizona, utilizing three economic measures: output, earnings and employment. Even these multipliers represent an oversimplification. The multiplier for any given industry probably is different in Phoenix than in Flagstaff. Further, the multiplier probably varies temporally, not immediately reaching its peak.

For most industries, the output multiplier, i.e., the total dollar change in output of all industries that occurs for each additional dollar of output by a given industry, falls into a narrow 1.8 to 2.0 band. It ranges from 1.38 for real estate to 2.45 for "manufacturing – primary metals industries."

More variation occurs in the earnings multiplier, i.e., the total dollar change in earnings of households employed in all industries for each additional dollar of output by a given industry, because of deviations in wage rates and in use of part-time and seasonal labor. The multiplier ranges from $.15 in real estate to $.89 in health services.

Wide deviation is also present in the employment multiplier, i.e., the total change in the number of jobs in all industries for each additional $1 million of output by a given industry. For example, only 12 jobs would accrue from this amount of additional manufacturing of motor vehicle equipment, whereas 74 jobs would

TABLE 3
IMPACT OF $100 MILLION CHANGE IN FINAL DEMAND
Selected Examples

	Output in Millions	*Earnings in Millions*	*Employment (Number of Jobs)*
Out-of-State Tourism	$157.5	$54.1	4,723
New Construction	207.6	69.4	4,020
Copper Mining	180.5	54.0	2,470
Agricultural Production	195.2	54.0	4,280
Manufacturing of Electronic Equipment	191.4	65.1	3,250
Real Estate	138.0	15.3	1,370

Source: Center for Business Research, College of Business, Arizona State University; and U.S. Department of Commerce, Bureau of Economic Analysis.

result from such an addition to personal services.

Examples

The effect of an additional $100 million of output delivered to final demand – that is, to ultimate purchasers, such as to consumers outside Arizona – is illustrated for various situations in Table 3. The estimate for the tourism industry, which consists of several diverse sectors such as retail trade and transportation, is based on several multipliers; the $100 million was distributed according to spending patterns found in the 1984 tourism study. The tourism example assumes that retail goods purchased by tourists in Arizona were manufactured elsewhere. The multipliers would be larger if the goods were produced in Arizona.

Of the examples shown, new construction has the largest impact on both total output and total earnings. More jobs, however, would be created by additional tourism and agricultural production.

TRENDS

The four Cs (agriculture and mining) were important to Arizona in the past. In 1929, for example, these industries together contributed nearly one-third of the state's personal income. Mining declined first, replaced by government during the 1930s. Agriculture declined more recently, replaced by manufacturing during the 1950s and by services in the last few years.

When taking into account changes in the national industrial structure since 1929, the growth of three industries in Arizona has been particularly more rapid than the expansion of their national counterparts: manufacturing; construction; and finance, insurance and real estate. While the sectoral shares of government and services increased in Arizona, similar advances were occurring nationwide.

Most changes to the state's industrial structure did not occur recently. By the mid-1960s, the economy's structure closely resembled that of today.

– Tom R. Rex
Research Manager

Complete Report Available

This article is the executive summary of a larger report on Arizona's industrial structure. Copies of the complete report, which includes more than 20 pages of tables, as well as more in-depth textual analysis, may be obtained by calling or writing the Center for Business Research, College of Business, Arizona State University, Tempe, AZ 85287; (602) 965-3961.

"Cost of Living," from page 1

The most readily available cost-of-living data for U.S. cities are published quarterly by the American Chamber of Commerce Researchers Association *(ACCRA Intercity Cost of Living Index)*. The number of cities and towns participating in the ACCRA study varies each quarter but generally exceeds 225, providing a wide base of data on communities of all sizes nationwide. Unfortunately, within Arizona, only Phoenix and Tucson currently participate in the study, and no cost-of-living information is publicly available for Arizona communities outside the state's two metropolitan areas.

As part of the Center for Business Research's ongoing research program on inflation and living costs in Arizona, the Center recently completed the pilot phase of a project to develop information on relative living costs in Arizona communities. The Center collected price data in Casa Grande, Page, and Show Low – three non-metropolitan communities located in different parts of the state. This information was then compiled with the ACCRA's 1986 living cost data for the Phoenix and Tucson metropolitan areas and 1985 data for Yuma, to produce a first look at the pattern of relative living costs statewide.

METHODOLOGY

The Center based its procedures for computing measures of relative living costs for each of the communities on the methodology used in the ACCRA study. This methodology employs a fixed market-basket approach: that is, the same set of goods and services are priced in each locality. The price data are then weighted by the relative importance of each type of good/service among the total consumer expenditures of typical U.S. households to derive an overall measure of the relative cost of living. It is important to recognize that differences in living costs identified by this fixed market-basket methodology are due to local differences in prices. Differences in lifestyle, reflected by differences in the type and quantity of goods and services typically purchased, are not taken into account.

For this study, the relative cost-of-living measures were computed by comparing prices of a sample of 59 consumer goods and services in each of the other five Arizona communities with Phoenix prices for the same items. From these price data, cost-of-living indexes were computed for each locality. The indexes show the ratio of living costs in each city relative to the Phoenix area, where the cost of living is expressed as a value of 100. Thus, an index

value of 105 would indicate that the relative cost of living is 5 percent higher than that in the Phoenix area. In addition to an overall index, separate indexes were calculated to show each city's relative cost of living for six major expenditure categories – grocery items, housing, utilities, transportation, health care, and miscellaneous goods and services.

FINDINGS

A comparison of these indexes of relative living costs for Casa Grande, Page, Show Low, Tucson, and Yuma are presented in Table 1. The overall cost-of-living index figures show living costs to be lower in the two non-metropolitan communities in the southern part of the state than in the Phoenix area. In the case of the two northern Arizona towns, living costs for the average household are 4 percent higher in Page than in Phoenix and 5 percent higher in Show Low.

The overall index value for Tucson from the second quarter 1986 ACCRA study reveals a cost of living that is 4 percent lower than that in the Phoenix area and similar to the levels in Casa Grande and Yuma. Inspection of detailed information from the ACCRA study demonstrates, however, that almost all of the Tucson/Phoenix cost differential results from much lower utility costs in Tucson. If utility costs are excluded from the calculations, overall cost levels are very close to those for Phoenix.

Cost differences for each of the six expenditure categories follow:

(1) *Food:* Food costs were higher in all five Arizona communities included in the study, relative to those in metropolitan Phoenix. Price levels were particularly high in the two northern Arizona towns. Retail stores in both Page and Show Low must incur substantial transportation costs to ship goods from distribution centers (usually located in the Phoenix area). The small and isolated nature of the retail sector in these communities also results in a much different competitive environment – fewer sales, less discount pricing, etc. – than is found in the state's large metropolitan areas.

(2) *Housing:* Housing costs are higher in Phoenix than in each of the other five communities included in the study. Again relative to the southern Arizona cities, housing costs were found to be higher in Page and Show Low, although still lower than in the Phoenix area. Specific circumstances in both of these communities cause land prices to be higher than in many other non-metropolitan areas. The Show Low/Lakeside/Pinetop area has experienced rapid growth in recent years, with its emergence as one of the state's prime vacation/recreation destinations. In Page, the supply of residential land is limited, since the city is surrounded by the Navajo Reservation and federal land.

(3) *Utilities:* No consistent pattern is evident for utility costs. As noted above, utility costs for Tucson, as reported in the ACCRA study, are much lower than for the other five cities included in the study. The difference between Show Low and the Phoenix area results from the smaller town's much higher telephone charges and somewhat higher electric rates. Yuma's higher utility costs result primarily from higher electrical consumption.

(4) *Transportation:* Transportation costs were generally higher outside the Phoenix area, with the exception of Yuma. Most of the differentials resulted from higher retail gasoline prices in the communities outside the Phoenix metropolitan area.

(5) *Health Care:* Costs of health care commodities and services were higher in the Phoenix area than in each of the other cities, with the exception of Show Low. Drug/medical supply prices were higher outside the Phoenix area, but this difference was more than offset by lower hospital costs and professional fees in the other cities, with the exception of Show Low.

(6) *Miscellaneous goods and services:* Prices within this expenditure category, which comprises a variety of personal and household services and consumer goods, were not found to vary greatly among the six Arizona cities. A general pattern existed of somewhat higher prices for consumer goods items and lower prices for services in the non-metropolitan communities.

TABLE 1
COMPARATIVE LIVING COSTS FOR SIX ARIZONA COMMUNITIES
Second Quarter 1986*
(Phoenix = 100)

Index	Tucson	Casa Grande	Page	Show Low	Yuma
Overall	96	96	104	105	95
Food	103	103	121	115	104
Housing	92	85	97	99	79
Utilities	71	102	99	105	112
Transportation	103	106	105	113	96
Health Care	95	86	97	104	85
Miscellaneous Goods/Services	100	96	102	102	99

*Yuma data is for second quarter 1985.

Source: Compiled by the Center for Business Research, College of Business, Arizona State University; using data from Center surveys and *ACCRA Intercity Cost of Living Index,* Second Quarter 1985 and Second Quarter 1986.

TABLE 2
COST OF LIVING
BY POPULATION SIZE
(U.S. Average = 100)

Population Class	Index
Less than 25,000	96
25,000 - 74,999	97
75,000 - 124,999	99
125,000 - 199,999	99
200,000 - 399,999	100
400,000 - 999,999	101
1 million or more	106

Source: T.D. Hogan and T.R. Rex, "Intercity Differences in Cost of Living: Results from a New Database," *Growth and Change,* October 1984, pp. 16-23.

COMPARISON TO NATIONAL PATTERNS

Previous studies of intercity differences in living costs usually have found that the larger the community, the higher the cost of living. This relationship is also demonstrated in

cost-of-living data from the 1980 ACCRA Study, if it is organized by the size of each community's urban area, as defined by the 1980 Census (see Table 2). The difference averaged 10 percent between the smallest towns and the largest urban areas. This relationship was identified for the housing, transportation, health care, and miscellaneous expenditure categories but not for either food or utility costs.

The pattern of cost-of-living differentials discovered in the sample of six Arizona communities is somewhat different than this national pattern. Living costs in the two smallest cities, Page (a 1985 population of 6,000) and Show Low (population 5,000), were found to be higher than in larger communities. For the four southern Arizona cities, however, the positive link between size and living costs was evident, though not to the same degree that it is on a national level.

Geographical isolation and the small size of their retail sectors apparently result in the higher prices of many consumer goods in the two northern Arizona communities. A comparison to the two large metropolitan areas revealed that the four smaller, rural communities charged lower prices for many services and higher prices for the many consumer goods that must be transported from distribution centers in the metropolitan areas. If the goods/services are grouped into two major categories – transported items (groceries, apparel, etc.) and non-transported items (housing, utilities, services, etc.) – and relative cost-of-living indexes for the two groups are calculated, a pattern emerges: Prices of transported items in the non-metropolitan localities are higher than in the Phoenix area, while services and other non-transported items are generally less costly outside the metropolitan areas (Table 3).

TABLE 3
COMPARATIVE COST OF LIVING INDEXES FOR TRANSPORTED VERSUS NON-TRANSPORTED GOODS AND SERVICES
Second Quarter 1986
(Phoenix Overall Index = 100)

Index	Casa Grande	Page	Show Low
Transported Goods	102	112	110
Non-transported Goods/Services	91	97	100

Source: Center for Business Research, College of Business, Arizona State University.

– Timothy D. Hogan

Dr. Hogan is Professor of Economics and Director of the State Data Center/ASU.

Partial funding support for this study was provided by a grant from Local 266 of the International Brotherhood of Electrical Workers.

Valley Inflation Still Near 1 Percent

The Metropolitan Phoenix Consumer Price Index again measured mild inflation during third quarter 1986, the fifth consecutive quarter of little or no change in prices of goods and services. However, the 0.6 percent advance, on both an unadjusted and seasonally adjusted basis, matched the largest gain of these five quarters (see Table 1).

The third quarter 1986 index, 193.7 (1977 = 100), was only 1.2 percent higher than the index for third quarter 1985.

COMPONENT INDEXES

Food and beverage prices, on a seasonally adjusted basis, matched the greatest gain in at least three years, contributing the most to the overall inflation rate. Prices of other goods and services also climbed more than in at least three years.

These gains, however, were largely offset by the fifth consecutive quarterly decline in transportation costs; gasoline prices again fell at double-digit rates. Medical care costs also helped to moderate overall inflation by recording their smallest gain in several years.

TABLE 1
PERCENT CHANGES IN METROPOLITAN PHOENIX CONSUMER PRICE INDEX

		Seasonally Adjusted from Preceding Quarter						
Expenditure Category	*Relative Importance*	*1st 1985*	*2nd 1985*	*3rd 1985*	*4th 1985*	*1st 1986*	*2nd 1986*	*3rd 1986*
ALL ITEMS	100.0	1.6	1.3	0.3	0.6	-0.2	0.4	0.6
Food and Beverages	18.7	1.6	0.9	-0.1	2.3	0.5	1.0	2.3
Housing	39.5	1.2	0.6	1.8	-0.4	0.7	0.2	1.0
Apparel and Upkeep	4.8	1.8	3.3	-1.9	2.5	-3.3	5.6	-2.5
Transportation	21.2	2.0	2.0	-2.1	-0.6	-2.5	-1.9	-1.1
Medical Care	6.9	2.6	2.7	1.6	1.8	1.3	1.7	0.2
Entertainment	4.6	2.9	3.5	2.1	5.3	-1.7	2.4	-0.6
Other Goods and Services	4.3	1.7	1.7	-0.2	1.2	1.7	0.7	2.1

Source: Center for Business Research, College of Business, Arizona State University, in cosponsorship with Valley National Bank.

Food and Beverages

A sharp 3.2 percent increase in grocery prices led this category's advance. In contrast, prices for food away from home continued to rise moderately, and prices of alcoholic beverages fell (see Table 2).

Within the food at home category, prices of cereal and bakery products again advanced moderately, while the index for other food at home declined slightly. However, after little change in the second quarter, prices of both dairy products and fruits

and vegetables rose approximately 3.5 percent.

The index for meats, poultry, fish and eggs soared 7.1 percent during the third quarter, following five consecutive quarters of declines or insignificant gains. Prices of poultry and pork jumped 12 and 10 percent, respectively, while all other subcategories posted gains in excess of 3.5 percent.

Housing

Modest inflation persisted in the housing category. Prices of fuel and other utilities again fell, led by the eighth consecutive decline in natural gas rates. The index for household furnishings and operations also dropped slightly, for the second straight quarter.

While homeowners' costs continued to rise at a moderate rate, renters' costs jumped more than 3 percent, the largest gain in 2-1/2 years. This surge, however, followed three consecutive quarters of virtually no change.

Transportation

Transportation costs dropped an additional 1.1 percent during third quarter 1986, placing them 6.2 percent lower than they were in third quarter 1985. After falling nearly 16 percent during the second quarter, gasoline prices declined another 11.5 percent during the third quarter; however, they were not the sole contributor to the transportation category's third quarter decline.

Vehicle finance charges dropped a steep 6 percent; these charges generally have been falling since late 1984. Public transportation costs declined 5 percent, in part due to lower airline fares. Prices of vehicle parts and equipment and of new autos also were lower.

These declines were offset, in part, by a huge 17.2 percent boost in auto insurance premiums; the increase during the four quarters ending third quarter 1986 was 25 percent.

Medical Care

Lower health insurance premiums held the advance in the medical care index to just 0.2 percent. After years of rising at double-digit annual rates, leading all categories of the CPI, medical care costs increased only 4.9 percent during the year ending third quarter 1986.

While most of the other medical care subcategories rose moderately during the third quarter, hospital costs climbed 3.1 percent, the most in more than two years.

TABLE 2
METROPOLITAN PHOENIX CONSUMER PRICE INDEX
Third Quarter 1986

	Index (1977=100)		Percent Change from	
Expenditure Category	*Last Quarter*	*This Quarter*	*Last Quarter**	*Year-Ago Quarter*
ALL ITEMS	192.6	193.7	0.6	1.2
Food and Beverages	178.3	181.1	2.3	5.9
Food	178.5	181.5	2.6	5.7
Food at Home	175.2	179.3	3.2	6.3
Cereal and Bakery Products	197.8	197.2	0.8	6.2
Meats, Poultry, Fish, and Eggs	156.3	166.5	7.1	6.5
Dairy Products	162.2	166.4	3.6	3.4
Fruits and Vegetables	190.0	191.3	3.5	7.9
Other Food at Home	170.9	170.8	-0.3	6.2
Food Away from Home	181.9	182.8	1.4	4.6
Housing	202.2	205.1	1.0	1.5
Shelter	218.1	222.5	2.0	3.5
Renters' Costs**	116.4	120.3	3.4	3.6
Homeowners' Costs**	110.4	111.9	1.3	3.5
Fuel and Other Utilities	172.2	173.4	-1.2	-4.5
Gas (piped) and Electricity	188.7	192.8	-0.9	-6.5
Household Furnishings/Operations	153.6	153.5	-0.4	0.4
Apparel and Upkeep	151.7	146.8	-2.5	1.8
Transportation	178.2	176.0	-1.1	-6.2
Private Transportation	175.0	172.7	-0.7	-6.3
New and Used Cars	191.0	193.3	0.2	-0.3
Motor Fuels	154.9	134.1	-11.5	-31.6
Public Transportation	230.3	228.7	-5.0	-5.2
Medical Care	267.4	269.7	0.2	4.9
Entertainment	195.1	194.3	-0.6	5.2
Other Goods and Services	177.1	191.7	2.1	5.7

*Seasonally adjusted **Base period is second quarter 1983.

Source: Center for Business Research, College of Business, Arizona State University, in cosponsorship with Valley National Bank.

TABLE 3
METROPOLITAN PHOENIX CONSUMER PRICE INDEX
UNITED STATES AND COMPARATIVE CITIES
Third Quarter 1986

	Percent Change from Last Quarter*		Percent Change from One Year Ago			
Expenditure Category	*Phoenix*	*United States*	*Phoenix*	*United States*	*Denver*	*San Diego*
ALL ITEMS	0.6	0.7	1.2	1.6	-0.5	2.8
Food and Beverages	1.6	1.7	5.9	4.2	-0.8	4.0
Housing	1.4	1.1	1.5	2.7	0.2	5.5
Apparel and Upkeep	-3.2	0.3	1.8	0.8	-1.2	-0.6
Transportation	-1.3	-1.4	-6.2	-6.1	-6.6	-4.4
Medical Care	0.9	1.8	4.9	7.6	8.4	6.6
Entertainment	-0.4	0.7	5.2	3.4	0.2	4.4
Other Goods and Services	2.6	1.3	5.0	6.3	8.0	3.4

*Not seasonally adjusted

Source: Metropolitan Phoenix data compiled by the Center for Business Research, College of Business, Arizona State University, in cosponsorship with Valley National Bank; other data are from the U.S. Department of Labor, Bureau of Labor Statistics.

Other Categories

Apparel costs continued their seesaw pattern, dropping 2.5 percent after a large second quarter gain. A nearly 8 percent jump in the prices of toilet goods and personal care appliances caused inflation to accelerate in the other goods and

services category. Entertainment costs dropped slightly due to price declines in reading materials and in toys and hobbies.

COMPARISON AREAS

The second quarter inflation rate in the Phoenix area was nearly identical to the national average (see Table 3). In each major category except other goods and services, the advance in the Valley was comparable to, or smaller than, the national average.

Compared to one year earlier, the Phoenix inflation rate was less than the national average and the San Diego rate but greater than the deflation in Denver. The largest disparity between the Phoenix area and the national average was in the medical care category, due to a greater moderation in the Phoenix rate.

OUTLOOK

The forecast presented last quarter remains virtually unchanged. As predicted, the overall inflation rate was again modest during the third quarter, with further deflation in transportation and little gain in medical care costs.

Beginning in the fourth quarter, however, a gradual acceleration in the inflation rate remains likely. Deflation in the transportation category should end, adding at least 0.2 percentage points to the quarterly inflation rate. Medical care inflation should also accelerate but may be negated by a drop-off in food prices from their third quarter spike.

For 1987, an annual average rate of 4 percent is likely for the Metropolitan Phoenix CPI.

– Tom R. Rex
Research Manager

Arizona Births Outnumber Deaths by 30,000

Arizona's rate of net natural population increase – the number by which births outnumber deaths – has hovered near 1 percent since 1975. During the 1980s, approximately 30,000 more births than deaths have been recorded annually. This number constitutes 28 percent of the state's total population gain during that period, with migration accounting for the balance.

In 1984 (the last year for which complete data are available), births to Arizona residents numbered 55,109, more than twice the number of deaths (23,785). While births have steadily risen with the population, the birth rate – 18.0 per 1,000 residents in 1984 – has varied only slightly (see Figure I). The mortality rate – 7.8 per 1,000 residents in 1984 – has fluctuated even less.

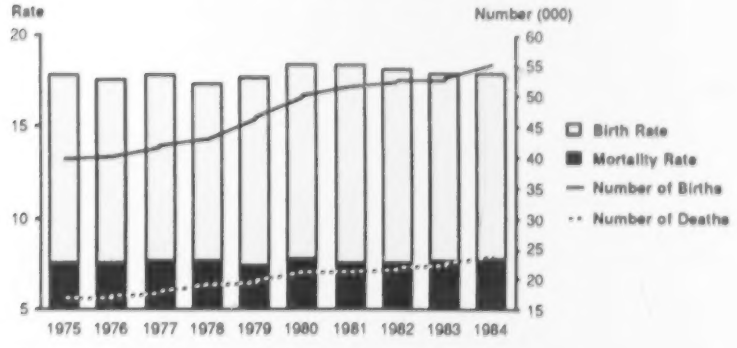
Compared to 30 years ago, however, birth rates have declined sharply, down approximately 40 percent from peak values reached during the 1950s baby boom. Mortality rates have fallen only slightly during this period.

Birth rates vary widely by Arizona county. In 1984, the highest rate (35), in Apache County, was nearly double the state's rate. Navajo County's rate (26) was next highest. The lowest rate (12) occurred in Yavapai County, with low rates also experienced in Mohave and La Paz counties. The geographic variation in the mortality rate was not as great, ranging from 12 per 1,000 residents in Yavapai County to 4 per 1,000 residents in Coconino County.

The net natural increase, expressed as a rate, was highest in Apache and Navajo counties, which have a young population and a high fertility rate. Mohave and Yavapai counties, home to many senior citizens, have the lowest rates of net natural increase. Births in Yavapai County barely outnumbered deaths in 1984.

A daily average of 151 babies were born to Arizona residents during 1984; deaths averaged 65 per day. This net natural increase peaks in the summer and early fall.

FIGURE I
BIRTHS AND DEATHS, 1975-84
Number and Rate Per 1,000 Population



Source: Arizona Department of Health Services

PROJECTIONS

Population projections released by the Arizona Department of Economic Security are for a net natural increase after 1990 that will be slightly less than the current level of 31,000 per year. Since the population will continue to grow rapidly, the growth rate from net natural increase will be halved by the end of the century, to just 0.5 percent per year.

This decline will result primarily from a falling birth rate, from 18 in 1984 to approximately 13 by the late 1980s, as the baby-boom generation ages out of the prime childbearing years. The mortality rate probably will remain nearly stable until the 21st century, when it will begin to creep up as the population ages.

– Tom R. Rex
Research Manager

September Purchasing Indicators Poise for Fourth Quarter Gain

In September, the Arizona economy showed signs of shaking off the hangover it experienced over the summer months. Lead times on shipments from vendors, new orders received, and production all registered upticks over August's anemic performance). The economy gave off conflicting signals, however, as inventory levels and employment both declined slightly. While the increases were not that strong, they may be the first signs that the economy is poised for a stronger upturn in the final quarter of the year.

The summer months were slow, as the economy went well into its fourth year of growth. It appeared that it might downshift even further and move into a minor slump. However, the Federal Reserve's reduction of interest rates, coupled with relatively stable prices, appear to have forestalled the danger of a downturn. The slight pickup in the growth rate in September should continue over the fourth quarter, and 1986 should close on an upbeat note. The effects of the tax bill are uncertain, but the factors that typically cause a downturn – high inflation and interest rates – are absent, which should permit Arizona's economic tempo to pick up somewhat.

Table 1 presents the results of the September survey of Arizona purchasing managers. Analysis of these results follows.

Prices paid for purchased items rose in September at the same rate as in August. The price increase rate in each of the preceding four months (beginning in June) was somewhat higher than in the first five months of the year and substantially larger than in almost any month of 1985. Yet the increase rate is well-contained compared to the first two years (1983 and 1984) of the current expansion. This relatively stable price picture is conducive to further economic growth.

Delivery time on shipments from vendors continued to lengthen, for the 12th consecutive month. The September stretch-out was twice as great as in August. While the lead time increases have been moderate through 1986, vendor order backlogs appear to be growing.

Inventory levels of purchased materials were unchanged in September, marking the sixth straight month of stable stocks. While inventory growth is not contributing to a continuation of the expansion, no inventory overhang threatens to swamp the economy.

New orders booked by Arizona firms enjoyed a good uptick in September. The increase rate was twice as large as in August and the highest since April. This marks the 45th consecutive monthly increase; the strength shown in September may be signaling a pickup in the growth tempo.

Production also jumped in September, mirroring the new order hike. This month-to-month increase was the largest since April.

Employment dropped slightly, bringing to a halt a string of 20 monthly advances. This was surprising, for employment normally would increase as needed to support the higher new order and production rates. Evidently, Arizona firms are exercising caution in their payroll expenditures.

Purchases of materials and supplies by Arizona firms increased in September at a higher rate than in August. The gain was the largest since May and was needed to meet the higher production rates.

– Harold Fearon

Dr. Fearon is the National Association of Purchasing Management Professor in the ASU College of Business.

Arizona Purchasing Survey

Now in its 25th year of monthly reporting, Dr. Harold Fearon's survey of Arizona business conditions utilizes data from a questionnaire sent to members of the purchasing management associations of Arizona and southern Arizona. It asks them to indicate the direction of activity - higher, unchanged, or lower - of seven key measures of economic activity in the month just ended. These purchasing managers deal daily with supply, demand, and price factors in the marketplace; their aggregate readings have accurately charted the state's economic course for two decades, providing timely data on turning points.

TABLE 1
SEPTEMBER PURCHASING SURVEY

	Percent of Purchasing Managers Indicating Each Response (September compared to August)		
Key Indicators	*Higher*	*Same*	*Lower*
Prices paid for major commodities	24	70	6
Delivery time from vendors	22	68	10
Purchased materials inventory level	24	51	25
New orders received	41	38	21
Production	36	47	17
Employment	16	66	18
Purchases	37	41	22

Source: Purchasing Management Association of Arizona and the Purchasing Management Association of Southern Arizona.

Arizona Leading Index Advances Further in August

After rising sharply in July, the Arizona Index of Leading Economic Indicators climbed an additional 0.3 percent in August, bringing the index to a new high of 109.7 (see Figure I). August's gain was the sixth in the last seven months. The cumulative increase during this period was the greatest since the initial recovery from the 1981-82 recession.

The diffusion index – the percentage of rising components – registered 55 percent in August after a first-time-ever reading of 100 percent in July. As has been typical in recent months, only a couple of components contributed significantly to the index's advance.

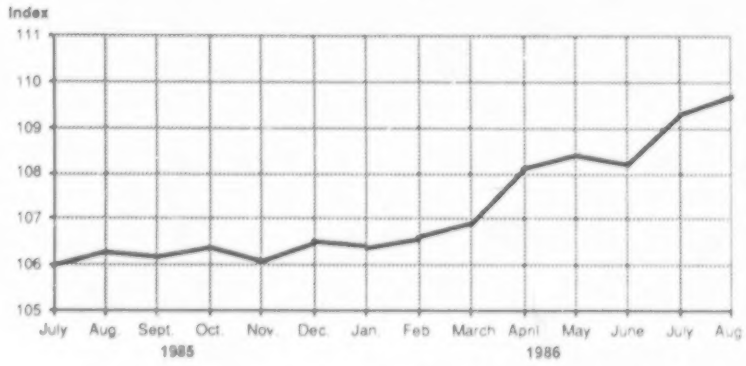
As seen in Table I, the contribution of the national money supply (M2) in August was greater than the net gain in the index. In each of the last seven months, the money supply provided the largest contribution. Its annualized increase of approximately 11 percent during this period has added to inflationary worries expressed in the financial markets.

Initial unemployment insurance claims yielded the only other sizable contribution in August. Claims declined (a positive indicator) for the fifth straight month.

The change in sensitive materials prices was the largest negative impact on the August index. The decline, following three months of moderate gains, was the largest since mid-1981, suggesting that an acceleration in inflation is not imminent.

None of the other components changed by more than a slight amount in August. The net effect of the five components derived from a survey of Arizona purchasing managers was nil.

FIGURE I
ARIZONA INDEX OF LEADING ECONOMIC INDICATORS



Source: Center for Business Research, College of Business, Arizona State University

TABLE 1
NET CONTRIBUTION OF INDIVIDUAL COMPONENTS TO THE ARIZONA INDEX OF LEADING ECONOMIC INDICATORS

	Net Contribution[+]			
	May	*June*	*July*	*Aug.*
Delivery Time*	-.01	-.09	.04	-.02
Inventory Levels*	-.04	-.01	.01	.04
New Orders*	.03	-.12	.04	-.04
Production*	-.12	-.03	.07	.04
Employment*	.02	-.06	.03	.00
Residential Building Permits	.09	-.24	.24	.04
Unemployment Insurance Claims	.03	.06	.01	.12
Average Workweek, Manufacturing	-.14	.02	.05	-.05
Money Supply	.40	.15	.47	.34
Change in Sensitive Materials Prices	.08	.12	.06	-.16
OVERALL INDEX	.33	-.19	1.02	.31

[+] The net contribution of each component is calculated by multiplying the monthly percent change in its index by its relative importance.

*Based on indicators from the purchasing management associations of Arizona and southern Arizona.

Source: Center for Business Research, College of Business, Arizona State University

OUTLOOK

Although the index's vigorous advance during the February-to-August period was caused primarily by the surge in money supply, slight gains elsewhere, including the reduction in the number of unemployment insurance claims, suggest that Arizona economic performance should begin to improve during late 1986. The chance of a recession beginning before spring 1987 remains less than 1 percent.

Gains in the Arizona leading index suggest acceleration in Arizona economic activity at a time when the national leading index is signaling further slow growth in the national economy. During most of 1985, the opposite was true: The national index indicated faster growth (that never developed), while the Arizona index signaled a continuation of moderate expansion.

– **Tom R. Rex**
Research Manager